

# DOOR LOCK

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention is related to a door lock, and more particularly to a door lock which is convenient to adjust for installing properly.

### 2. Description of Related Art

Referring to Figs. 9 and 10, a conventional door lock is composed of a core (91) received in a cylinder (90), a latch (92), a guard plate (93), a back cover (94), and a knob (95).

The cylinder (90), located at an exterior surface of a door (97), is mounted in a lock hole (971) defined through the door (97). The core (91) is received in the cylinder (90). The latch (92) is received in a latch hole (972) laterally defined in the door (97) and in communication with the lock hole (971). A faceplate (96) is mounted at a sidewall of the door (97), and the latch (92) can extend out from the faceplate (96). The guard plate (93) is provided in the lock hole (971) and at an interior surface of the door (97). Two first screws (932), respectively extending through two first holes (931) in the guard plate (93), are engaged in the cylinder (90). The guard plate (93) is provided with a flat finger (911) extending through the latch (92) and into the core (91). The back cover (94) is mounted outside the guard plate (93) by two second screws (943) respectively extending through two second holes (942) in the back cover (94) and two third holes (933) in the guard plate (93) and engaged in the cylinder (90). The knob (95) is rotatably mounted in a fourth hole (941) in the back cover (94), and the finger (931) is received in the knob (95).

1           Therefore, turning the knob (95) can turn the core (91) and move the  
2 latch (92) by means of the finger (931) to lock/unlock the door.

3           However, it is difficult to install the lock properly in one time, and the  
4 movement of the latch (92) will not be smooth when it is in an improper status,  
5 so that adjustment is often needed and may involve repeated trial and error.  
6 Referring to Fig. 11, during the adjustment, because the first and second screws  
7 (932, 943) are engaged in the cylinder (90) through the guard plate (93) and the  
8 back cover (94) respectively, the second screws (943) must be first disengaged to  
9 detach the back cover (94), and then the first screws (932) can be loosened for  
10 adjusting the guard plate (93). Thus, it is very inconvenient to attempt to adjust  
11 the lock. Furthermore, the installed door lock does not have a nice appearance  
12 because heads of the second screws (943) exposed from the back cover (94) can  
13 be seen.

14           Therefore, the invention provides a door lock to mitigate and/or obviate  
15 the aforementioned problems.

## 16 SUMMARY OF THE INVENTION

17           The main objective of the invention is to provide a door lock which is  
18 convenient to adjust for proper installation.

19           Another objective of the invention is to provide a door lock with an  
20 attractive appearance.

21           Other objectives, advantages and novel features of the invention will  
22 become more apparent from the following detailed description when taken in  
23 conjunction with the accompanying drawings.

## 24 BRIEF DESCRIPTION OF THE DRAWINGS

1           Fig. 1 is an exploded top sectional view of a first embodiment of a door  
2 lock in accordance with the invention;

3           Fig. 2 is an exploded side sectional view of the door lock in Fig. 1;

4           Fig. 3 is a top sectional view of the door lock in Fig. 1;

5           Fig. 4 is a front view of Fig. 3;

6           Fig. 5 is a top sectional view of a second embodiment in accordance with  
7 the invention;

8           Fig. 6 is a front view of Fig. 5;

9           Fig. 7 is a top sectional view of a third embodiment in accordance with  
10 the invention;

11          Fig. 8 is a top sectional view of the door lock in Fig.7 assembled in  
12 another manner;

13          Fig. 9 is an exploded top view of a conventional door lock;

14          Fig. 10 is a top view of the conventional door lock in Fig. 9; and

15          Fig. 11 is a front view of the conventional door lock in Fig. 9.

16          DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

17          Referring to Figs. 1-4, in a first embodiment in accordance with the  
18 present invention, a door lock has a cylinder (10) installed in a lock hole (61) of a  
19 door (60) and located at an exterior surface of the door (60). A core (11) with a  
20 key hole (not shown or numbered) is received in the cylinder (10). A flat finger  
21 (12) received in the lock hole (61) of the door (60) has a front end connected with  
22 the core (11). A plurality of threaded holes (13) is defined in the cylinder (10)  
23 around the core (12).

24          A latch (20) is movably received in a latch hole (62) laterally defined in

1 the door (60), and the finger (12) extends through the latch (20). A faceplate (22)  
2 with a latch opening (not numbered) is mounted on a sidewall of the door (60),  
3 and a tongue (21) of the latch (20) can extend out of or retract into the latch  
4 opening when the core (11) and the finger (12) are turned.

5 An inner cover (30) is provided at an interior surface of the door (60) and  
6 has a plurality of sink holes (31) defined therethrough and corresponding to the  
7 threaded holes (13). Multiple first screws (33) respectively extend through the  
8 sink holes (31) and are engaged in the threaded holes (13) to fasten the inner  
9 cover on the door (60). The inner cover (30) further has a first central opening  
10 (32) defined therethrough.

11 An outer cover (40) is provided outside the inner cover (30) and has a  
12 second central opening (41) defined therethrough and aligned with the first  
13 central opening (32). Especially referring to Figs. 2 and 4, the inner cover (30)  
14 has at least two lugs (34) formed around the first central opening (32) and  
15 respectively engaged in two apertures (42) defined around the second central  
16 opening (41) of the outer cover (40) to fasten the outer cover (40).

17 A knob (50) is provided outside the outer cover (40) and has a ringed  
18 recess (51) defined at an end facing the outer cover (40) and a shaft hole (55)  
19 longitudinally defined therein. A resilient member (52) is received in the recess  
20 (51) and abuts against the outer cover (40). A hollow shaft (53) extending  
21 through the first opening (32) and the second opening (41) has a rear end (531)  
22 positioned in the shaft hole (55) and an open front end (532) accessible for a rear  
23 end of the finger (12) to be inserted in the hollow shaft (53). A threaded aperture  
24 (56) is radially defined through the shaft hole (55), and a second screw (57) is

1 engaged in the threaded aperture (56) to further fasten the shaft (53) in the shaft  
2 hole (55). Moreover, a sleeve (58) is provided outside the front end (532) of the  
3 shaft (53) and has an opening (581) for the finger (12) extending therethrough.  
4 Thus, when the knob (50) is turned, the finger (12) can be driven to rotate to  
5 move the latch (20).

6 In this embodiment, the cross sections of the shaft (53) and the shaft hole  
7 (55) are rectangular. It should be understood by those skilled in the art that the  
8 cross sections can be other polygonal shapes.

9 According to the embodiment described as above, it is easy to remove  
10 the outer cover (40) from the inner cover (30) because there is not a screw  
11 provided therebetween. Therefore, during assembling of the door lock, if the  
12 latch (22) or the finger (12) is not in the proper position, it is convenient to detach  
13 the outer cover (40) and loosen the first screws (33) for adjusting the latch (22)  
14 and the finger (12). Furthermore, the first screws (33) are concealed in the outer  
15 cover (40), so that the door lock has a nice appearance.

16 In another embodiment as shown in Figs. 5 and 6, the door lock further  
17 has a guard plate (70) provided inside the inner cover (30). The guard plate (70)  
18 has a flange (71) received in the lock hole (61), and an edge (72) abutting a rim  
19 (35) of the inner cover (30). A plurality of first holes (73) corresponding to the  
20 sink holes (31) of the inner cover (30) is defined through the guard plate (70) and  
21 the first screws (33) respectively extend through the first holes (73). A third  
22 central hole (74) is defined through guard plate (70) and aligned with the first  
23 central hole (32) for the shaft (53) extending therethrough.

24 The door lock described as above also can be adjusted easily by means

1 of simply removing the outer cover (40) and directly loosening the first screws  
2 (33).

3 Referring to Fig. 7, in a third embodiment of the invention, the door lock  
4 has a guard plug (80) provided inside the inner cover (30). The guard plug (80)  
5 has a first step (81) and a second step (82), wherein a diameter of the first step  
6 (81) is smaller than a diameter of the second step (82). The first step (81) is  
7 received in the lock hole (61), and the second step (82) is received in the inner  
8 cover (30). A shoulder (83) is formed between the first step (81) and the second  
9 step (82) and abuts the rim (35) of the inner cover (30). The guard plug (80)  
10 further has a plurality of second holes (85) respectively aligned with the sink  
11 holes (31) for the first screws (33) extending through the second holes (85). A  
12 fourth central hole (84) is defined through the guard plug (80) for the shaft (53)  
13 extending therethrough.

14 Referring to Fig. 8, for matching the lock hole (61) with a different  
15 diameter, the guard plate (80) can be arranged with the second step (82) received  
16 in the lock hole (61) and the first step (81) received in the inner cover (30).

17 By using the guard plug (80), the door lock can be installed in the door  
18 (60) more securely and have a high safety feature.

19 It is to be understood, however, that even though numerous  
20 characteristics and advantages of the present invention have been set forth in the  
21 foregoing description, together with details of the structure and function of the  
22 invention, the disclosure is illustrative only, and changes may be made in detail,  
23 especially in matters of shape, size, and arrangement of parts within the  
24 principles of the invention to the full extent indicated by the broad general

- 1 meaning of the terms in which the appended claims are expressed.